

D.K.M. COLLEGE FOR WOMEN (AUTONOMOUS), VELLORE-1
SEMESTER EXAMINATIONS

APRIL – 2019

15CAPH2A

ALLIED: PHYSICS - II

Time : 3 Hrs

Max. Marks : 75

SECTION-A (10 x 2 = 20)

Answer ALL the questions.

1. State Heisenberg's Uncertainty Principle.
2. Find the de-Broglie wavelength associated with an electron moving with a velocity of 10^7 m/s.
3. What are exoergic and endoergic nuclear reactions?
4. ${}_{15}\text{P}^{30*} \longrightarrow {}_{14}\text{Si}^{30} + ?$
5. Write the important features of Miller indices of crystal planes.
6. Define unit cell and space lattice.
7. State the differences between a single mode and multimode step index fiber.
8. What are the advantages of optical fibers over conductive communication lines?
9. Write a note on AND & OR gate.
10. Prove $A*(B+C) = A*B + A*C$ using truth table.

SECTION-B (5 x 5 = 25)

Answer any FIVE of the following questions.

11. Using Heisenberg's uncertainty principle, explain how the momentum and position of an electron can be determined?
12. Explain G.P. Thompson's experiment of confirming the wave nature of electron.
13. What are the applications of radioisotopes?
14. Write a note on Nuclear Medicine.
15. Derive Bragg's law in crystal diffraction.
16. Explain the structure of NaCl.
17. Why NAND & NOR gate are called universal gate?
18. State and prove De Morgan's theorem.

SECTION-C (3 x 10 = 30)

Answer ALL the questions.

19. (a) Explain the Rutherford's experiment and discuss the transmutations by alpha particles.
(alpha-p, alpha n reactions).

(Or)

(b) Explain the seven crystal system with suitable diagrams and examples.

20. (a) Explain with suitable examples the ionic, metallic and covalent type of bonding in solids.

(Or)

(b) With a neat block diagram, explain the working of a fiber optic communication system.

21. (a) What is an Integrated circuit? Explain how ICs are fabricated. Mention the merits and demerits of IC fabrication?

(Or)

(b) What are flip flops? Explain the design and working of RS and JK flip flop in detail.